PLANT COMMUNITIES MAPPED ON FORT BELVOIR

Oak Mesic - Ericad (Heath Family) Forests

Oak / ericad forests are upland forests of gravelly ridges and dry slopes, generally located at the tops of hills and bluffs and along steep, well-drained slopes. The overstory is dominated by chestnut oak (*Quercus prinus*), with a mixture of northern red oak (*Quercus rubra*), white oak (*Quercus alba*), and scarlet oak (*Quercus coccinea*). At Fort Belvoir, vegetation in the understory varies between two topographically different types. Arid plateaus are generally composed of chestnut oak and white oak with huckleberry (*Gaylussacia baccata*) and tall deer berry (Vaccinium stamineum) in the understory. Cooler, northerly-facing steep slopes are dominated by chestnut oak, and the understory generally consists of mountain laurel (*Kalmia latifolia*) (Paciulli, Simmons and Associates, Ltd., 1998).

Beech Mesic - Mixed Oak Forests

At Fort Belvoir, beech mixed oak forests are generally located on the more gradual slopes, topographically below oak / ericad forests. Mixed oak species of white oak and northern red oak are dominant trees with American beech (*Fagus grandifolia*) dominant as shrubs in the understory. Other common shrubs in the understory consist of flowering dogwood (*Cornus florida*), red maple (*Acer rubrum*), and cherryleaf viburnum (*Viburnum prunifolium*). Occasional areas of mature American beech are found in lower, moister elevations or within ravines (Paciulli, Simmons and Associates, Ltd., 1998).

Tulip Poplar Mesic - Mixed Hardwood Forest

Tulip poplar mixed hardwood forests are upland forests of moist fertile ravine slopes and ravine bottoms. At Fort Belvoir, they are found in habitats similar to beech mixed oak forest, but are more common on more gradual slopes and ravine bottoms. Tulip poplar (*Liriodendron tulipifera*) trees are dominant within this vegetation community type, but American beech, white oak, and northern red oak are also mixed. Understory species are similar to that of beech mixed oak forests and consist of flowering dogwood, American beech, and red maple shrubs (Paciulli, Simmons and Associates, Ltd., 1998). A tulip popular mixed hardwood forest community just west of the mouth of Accotink Creek, within the Accotink Bay Wildlife Refuge, has been identified as a significant community of its type due

to its age and extent. This community type is common in Virginia; however, mature examples are rare (Hobson, 1996).

Seep Forests

Seep forests are often open-canopy forests of groundwater-saturated flats and slopes, generally surrounded by mixed hardwood forests. They occur along slopes where groundwater flows to the surface. Characteristic species are red maple, black gum (*Nyssa sylvatica*), sweetbay magnolia (*Magnolia virginiana*), skunk cabbage (*Symplocarpus foetidus*), sensitive fern (*Onoclea sensibilis*), and royal fern (*Osmunda regalis*). Key indicators are large mats of skunk cabbage and other herbaceous wetland vegetation. Although not a dominant forest type, seep forests are of special interest at Fort Belvoir, because they provide unique wetland habitats within the dominant upland forests (Paciulli, Simmons and Associates, Ltd., 1998). Three acid seep swamps on Fort Belvoir have been identified as significant vegetation communities. One of these is adjacent to the fresh tidal marsh at the mouth of Accotink Creek, another lies at the foot of upland slopes in Training Areas T-9 and T-7, and the third is located on HEC in the Dogue Creek watershed. These seeps provide habitat on Fort Belvoir for the state rare sphagnum sprite (*Nehafennia gracilis*) and a state -rare sedge (*Carex vestita*). They also provide habitat for several watchlist species (species ranked by DCR-NHP as S3 - "rare to uncommon," or SU - "status uncertain") including the gray petaltail (*Tachopteryx thoreyi*), aurora damsel (*Chromagrion conditum*), and eastern red damsel (*Amphiagrion saucium*). The watchlist dragonfly species, *Gomphaeschna furcillata*, has also been recorded in this habitat on Fort Belvoir (Hobson, 1996).

Mixed Pine Hardwood Forests

Mixed pine hardwood forests consist of transitional forests between early successional pine and climax hardwood types. Vegetation is a variable mix of pines, oaks, and other hardwoods. At Fort Belvoir, mixed pine hardwood forests were identified where hardwoods and pine trees appeared to be evenly distributed or where neither hardwoods nor pines appeared to be more than 70% dominant. Virginia pine is the dominant pine in mixed pine hardwood forests, although some stands mixed with loblolly pine exist. Dominant hardwoods in mixed pine hardwood forests are variable, but can be generalized

based on topography and their position bordering mapped hardwoods. For example, mixed pine hardwood forests mapped at the tops of dry ridges and bordered by oak/ericad forest are likely to have chestnut oak or scarlet oak as the dominant hardwood in the mix. Lowland areas tend to have tulip poplar and red maple mixed with Virginia pine. Upland areas tend to be mixed with white oak and chestnut oak (Paciulli, Simmons and Associates, Ltd., 1998).

Virginia Pine Forests

Virginia pine forests consist of early successional forest of old fields or other land clearings dominated by Virginia pine (greater than 70% dominance). Virginia pines are most abundant and occur naturally compared to forests of loblolly pine and white pine, which most likely have been introduced by plantings in former clearings (Paciulli, Simmons and Associates, Ltd., 1998).

Loblolly Pine Forest

Small portions of the installation have been planted in loblolly pine. The loblolly pine forests at Fort Belvoir are usually planted and often appear in rows. Native stands are not prevalent at Fort Belvoir (Paciulli, Simmons and Associates, Ltd., 1998).

White Pine Forest

One stand of planted white pine large enough for mapping occurs at the Elhers Road entrance to Davison Army Airfield. White pine is also used throughout Fort Belvoir for landscaping; however, these areas were not included because they are located within improved grounds (Paciulli, Simmons and Associates, Ltd., 1998).

Moderately Well-Drained Floodplain Hardwood Forests

Moderately well-drained floodplain hardwood forests are dominant within the major floodplains. They are palustrine forests of moderately well-drained to somewhat poorly-drained floodplain bottomland. These hardwood forests are generally located above streambanks in non-hydric soils that are mixed with upland and wetland vegetation. They are flooded regularly, but the well-drained soils do not retain hydrology long enough to

support wetland vegetation. At Fort Belvoir, moderately well-drained floodplain hardwood forests are dominated by tulip poplar mixed with red maple and sweet *gum (Liquidambar styraciflua*) trees. The understory consists of ironwood (*Carpinus caroliniana*), red maple, and spicebush (*Lindera benzoin*) shrubs. In both the moderately well-drained floodplain hardwood forests and tulip poplar mixed hardwood forests, the tulip poplar is the dominant indicator species. However, the composition of other characteristic species is significantly different. Characteristic species of moderately well-drained floodplain hardwood forests are adapted to moister soils within the floodplain (Paciulli, Simmons and Associates, Ltd., 1998).

Poorly Drained Floodplain Hardwood Forest

The poorly drained floodplain hardwood forest type is a palustrine forest occurring on somewhat poorly- drained to very poorly-drained floodplain bottomlands and sloughs. Its composition is variable, and it is generally located on hydric soils (soils that are inundated or saturated for a significant amount of time so that anaerobic conditions are created) dominated by hydrophytic vegetation (plants typically found in wetland habitats). They are most extensive along Pohick Creek and Accotink Creek floodplains and consist of a variable mix of pin oak (*Quercus palustris*), willow oak (*Quercus phellos*), green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), red maple, river birch (*Betula nigra*) and sweet gum. The understory contains highbush blueberry (*Vaccinium corymbosum*) (Paciulli, Simmons and Associates, Ltd., 1998).

Poorly drained hardwood forests differ from moderately well-drained hardwood forests in that they are located on wetter soils and are dominated by hydrophytic vegetation. Moderately well-drained floodplain hardwood forests are located within drier soils and are mixed with hydrophytic and non-hydrophytic vegetation. Poorly drained floodplain hardwood forests are usually jurisdictional wetlands under Section 404 of the Clean Water Act.

Non-Tidal Marsh/Beaver Pond Community

Non-tidal marsh / beaver pond areas are successional herbaceous to scrubby wetlands of variable composition. They consist of emergent wetlands that are above the tidal limits of

Accotink Creek and Pohick Creek, and emergent wetlands within Jackson Miles Abbott Wetland Refuge along Dogue Creek. Large areas of emergent wetlands border the braided channels within Pohick Creek's floodplain and above the tidal influence. Many of these areas are created or influenced by beaver activity that has caused flooding and created open marshes in areas previously dominated by hardwood forests. Beavers have created a large marsh along Poe Road. Vegetation composition is variable, consisting of emergents including arrow arum (*Peltandra virginica*), rice cutgrass (*Leersia oryzoides*), sedges (Carex sp.), rushes (Juncus sp.), smartweeds (Polygonum sp.), and swamp rose mallow (*Hibiscus moscheutos*). Common shrubs are buttonbush (*Cephalanthus occidentalis*), swamp rose (*Rosa palustris*), and swamp dogwood (*Cornus amomum*) (Paciulli, Simmons and Associates, Ltd. 1998). The beaver pond complexes at Fort Belvoir support two state-rare damselfly species: the sphagnum sprite and the furtive forktail (*Ischnura prognata*). The state rare least bittern (*Ixobrychus exilis*) has been known to use marshes in the Dogue Creek wetlands (Hobson, 1996).

Tidal Marsh Community

Tidal marshes dominate shallow tidal areas of Accotink and Pohick Creeks, and also occur at the mouths of several streams that flow from Fort Belvoir into surrounding tidal waters. Tidal marsh consists of a variable mix of emergent wetland vegetation such as arrow arum, yellow pond lily (*Nuphar luteum*), pickerelweed (*Pontedaria cordata*), wild *rice (Zizania aquatica*), cattail (*Typha latifolia*), and river bulrush (*Scirpus fluviatilis*) (Paciulli, Simmons and Associates, Ltd., 1998).

The fresh tidal marsh at the mouth of Accotink Creek is an area of semipermanently flooded herbaceous vegetation, which has been identified as a significant community. It represents a community type that is fairly uncommon in Virginia. This community is in good to excellent condition with little evidence of disturbance and is one of the better examples of its type in Virginia. Several rare plant species, including vetchling (*Lathyrus palustris*), water-plantain spearwort (*Ranunculus ambigens*), and river bulrush (*Scirpus fluviatilis*) occur within this community at the head of Accotink Bay. The watchlist plant species large bur-reed (*Sparganium eurycarpum*) and creeping spikerush (*Eleocharis smallii*) also occur within this community (Hobson, 1996).

Freshwater Tidal Swamp Forest Community

Freshwater tidal swamp forests are tidally influenced palustrine forests. At Fort Belvoir, the dominant trees are green ash and red maple. The understory composition is variable, and influenced by the extent of tidal flooding and openness of the canopy. Typical shrubs in less inundated areas include highbush blueberry, arrowwood viburnum, and silky dogwood (Cornus amomum) in areas less inundated. Areas that have an open canopy and are semi-permanently to permanently flooded have an understory that includes typical broadleaf emergents such as arrow arum, yellow pond lily and pickerelweed that occupy adjacent tidal marshes (Paciulii, Simmons and Associates, Ltd., 1998). Two significant areas of tidal swamp forest occur as peninsulas that extend into Gunston Cove. Tidal forests are also located along the upper tidal limits of Accotink Bay.

Tidal Scrub/Shrub Wetland Community

Tidal scrub / shrub wetlands at Fort Belvoir are the least dominant tidal vegetation community and are generally located along the edges of tidal swamp forests near the transition to tidal marsh. They are tidally influenced palustrine scrub / shrub wetlands dominated by woody plants less than three inches in diameter at breast height, but greater than 3.2 feet in height. Tidal scrub / shrub vegetation at Fort Belvoir consists of black willow (*Salix nigra*), red maple, common alder (*Alnus serruluta*), and green ash (Paciulli, Simmons and Associates, Ltd., 1998).

Old Field Grasslands

In the Mid-Atlantic region, old field grasslands generally are abandoned fields and clearings that are still in early successional stages. At Fort Belvoir, they generally consist of unimproved open fields or areas that are infrequently mowed. Old field grasslands occur in areas previously cleared for landfills, farming, and training. Approximately 190 acres of grasslands and potential grasslands have been identified at Fort Belvoir. They range in size from less than one-half acre to more than 20 acres (PaciuIli, Simmons and Associates, Ltd., 1996). Old field grasslands do not include grounds such as golf course roughs since they tend to be landscaped and mowed occasionally. Dominant vegetation consists of a variable mix of grasses and wildflowers (forbs). Characteristic species are *broomsedge (Andropogon*

virginicus), tall fescue (*Festuca elatior*), and bushclover (*Lespedeza cunneata*). These areas are valuable for providing habitat for song birds, ground nesting birds, and small mammals, which provide food sources for wildlife such as fox and birds of-prey (Paciulli, Simmons and Associates, Ltd., 1998).

Urban Land

All developed areas-at Fort Belvoir are identified as urban land. Urban land consists of improved and semi-improved grounds. This includes open lands, natural tree stands and woodland borders, buildings and paved areas, turf and landscaped areas. Open areas such as the airfield and golf courses are considered urban land. The vegetation is characterized by a wide variety of native trees, planted landscape trees and shrubs, tall fescue grass, and Kentucky bluegrass (*Festuca arundinacea*) (Paciulli, Simmons and Associates, Ltd., 1998). Vegetation management of developed lands is presented in the following chapter 10.0 Developed Areas.